SERIAL No. 3005

ONKYO SERVICE MANUAL

SOLID STATE STEREO RECEIVER

TX-440

ONKYO®
AUDIO COMPONENT

SPECIFICATIONS

TUNER SECTION

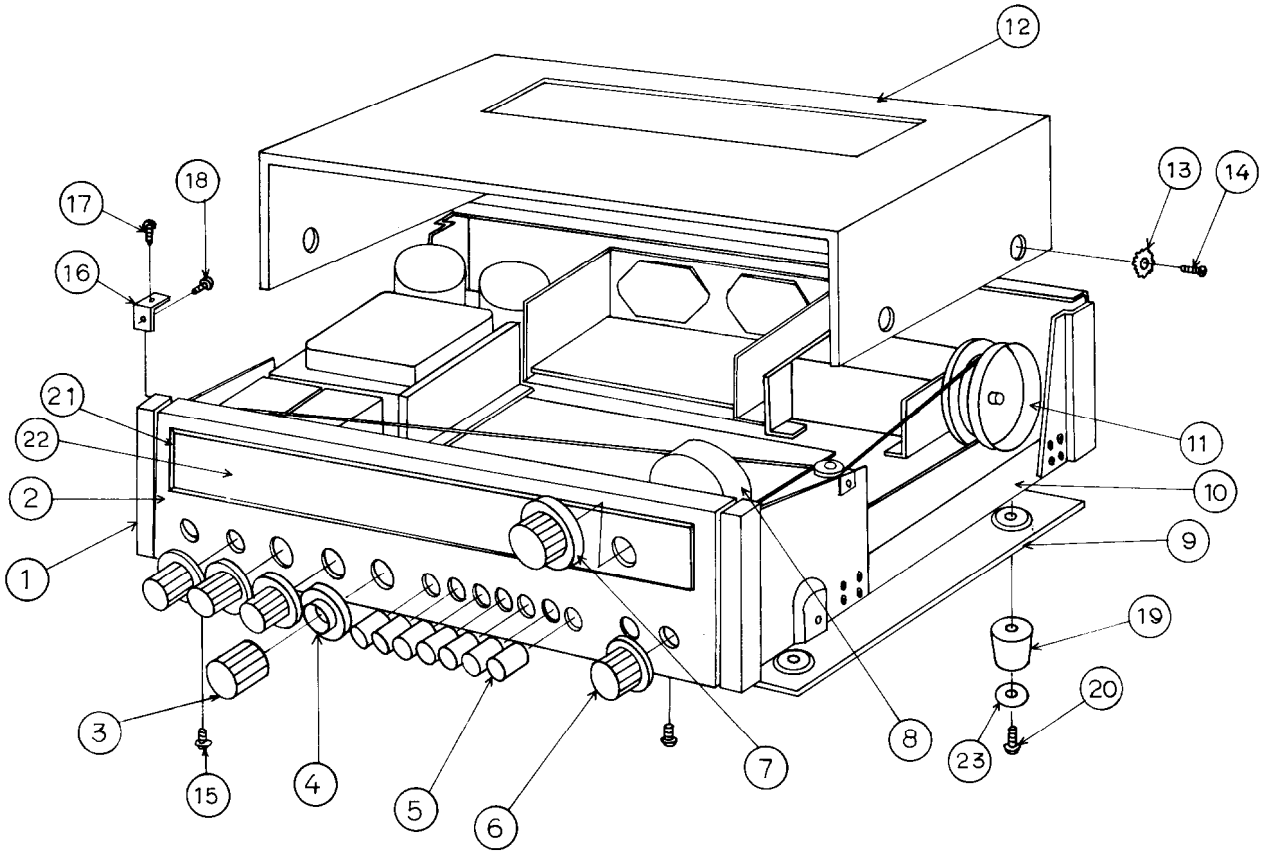
Tuning Range	FM:88–108MHZ AM:530–1605kHz
Sensitivity	FM:2.0μV(IHF) AM:40μV, 150μV/m
Intermediate Frequency	FM:10.7MHz AM:455kHz
Capture Ratio	FM:2dB
Image Rejection Ratio	FM:70dB AM:35dB
IF Rejection Ratio	FM:90dB AM:40dB
Signal to Noise Ratio	FM:70dB AM:40dB
Alternate Channel att.	FM:65dB
AM Suppression Ratio	FM:50dB
Harmonic Distortion	FM MONO:0.4% AM:1% FM ST:0.8%
Frequency Response	FM:20–15,000Hz ± 1.5dB
Stereo Separation	FM ST:40dB at 400Hz 30dB 100–10,000Hz
Muting Level	FM:20μV
Stereo Lamp Level	FM ST:20μV
Tuning Meter	Signal Strength & Center Tuning

AMPLIFIER SECTION

Power Output	100W (IHF 4Ω)
Dynamic	80W (IHF 8Ω)
Continuous	32W/32W (8Ω Each channel driven) 35W+35W (4Ω Both channel driven) 28W+28W (8Ω Both channel driven) 21W+21W (8Ω In the Range of 20–20,000Hz THD 1%)
Total Harmonic Distortion	0.5% at Rated Power 0.3% at 10W
Damping Factor	30 (8Ω 1kHz 10W)
Frequency Response	20–30,000Hz (±1dB)
Power Bandwidth	20–20,000Hz (–3dB THD 0.5%)
Sensitivity and Impedance	PHONO:2.5mV/50kΩ, AUX:200mV/50kΩ MIC:4mV/50kΩ, TAPE PLAY–1/–2:200mV/50kΩ TAPE REC–1/–2:200mV/100kΩ
Phono Overload	100mV at 1kHz, 420mV at 10kHz 0.3%
Bass Control	±8dB at 100Hz
Treble Control	±8dB at 10kHz
Signal to Noise Ratio	PHONO:65dB (IHF C NETWORK) AUX:75dB (IHF C NETWORK)
Loudness Control	+7dB at 100Hz, +4.5dB at 10kHz
Filter High	6kHz (6dB/oct)
Low	70Hz (6dB/oct)
Power Supply Rating	AC 120V 60Hz or AC 110/120/220/240V 50/60Hz
Semiconductors	FET:1 Transistor:33 Diode:33 IC:3
Dimensions	18 1/2"W x 14 3/4"D x 5 1/2"H 470W x 375D x 140Hmm
Weight	10.7kg, 23.5 lbs.

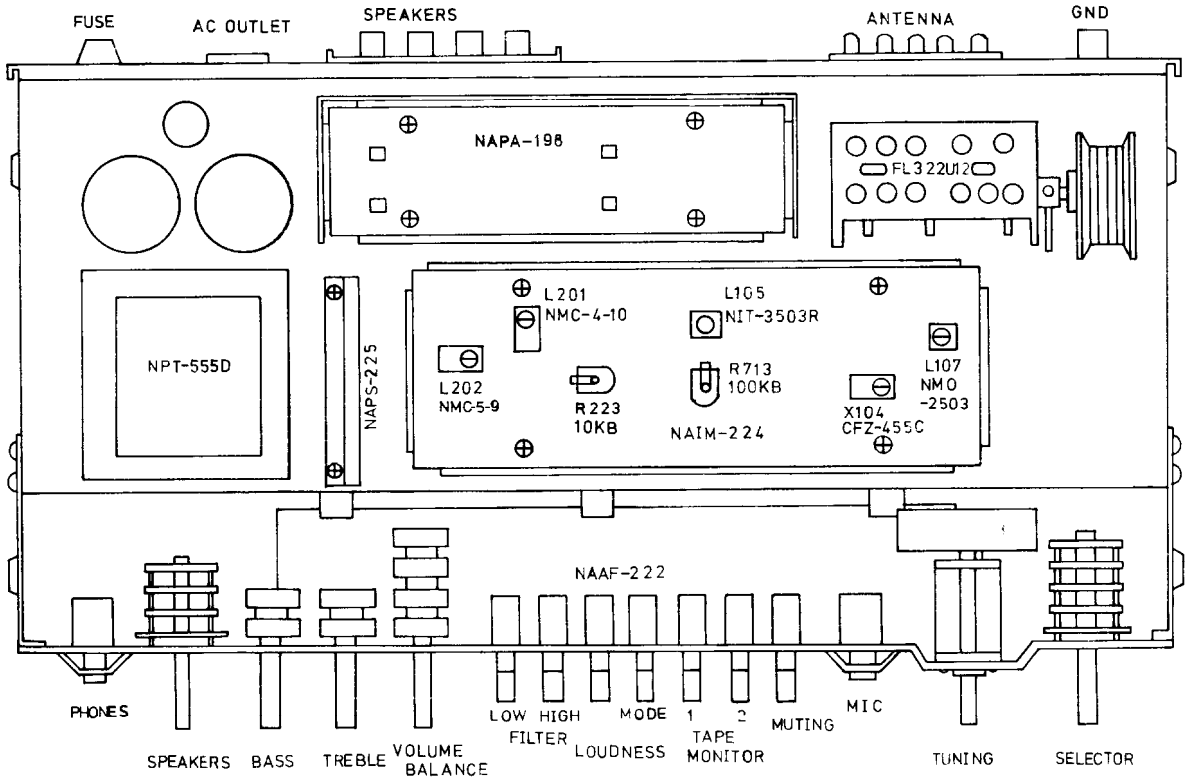
Specifications and Features are subject to change without notice.

COMPONENT LOCATIONS

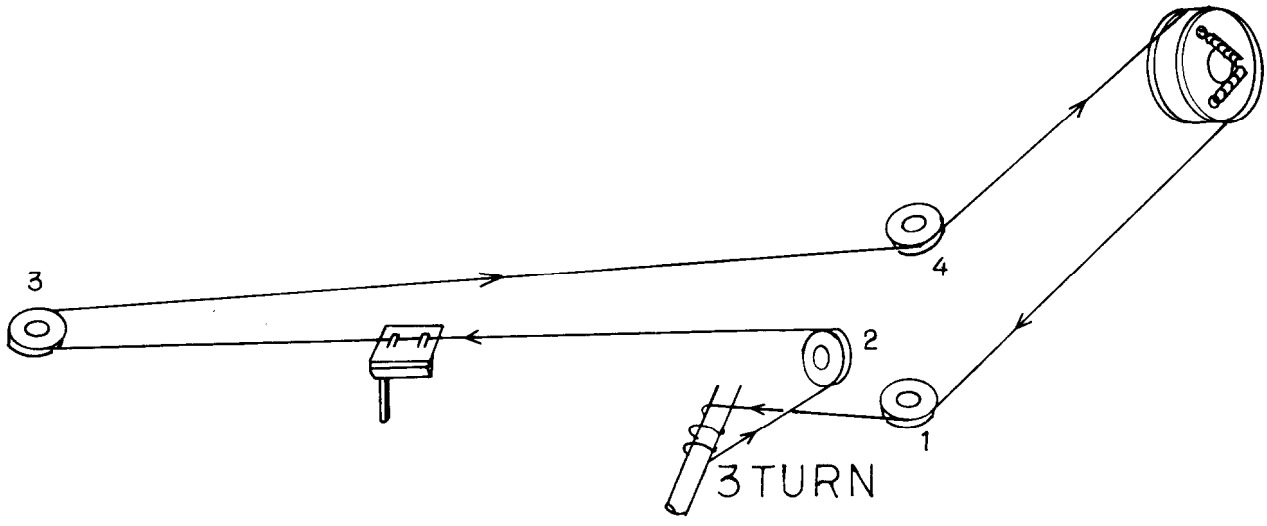


KEY NO.	DESCRIPTION	KEY NO.	DESCRIPTION
1	End Cap	13	Toothed Lock Washer
2	Front Panel	14	Truss Screw
3	Knob–Tone (small)	15	Tapping Screw
4	Knob–Tone (large)	16	Joiner (B)
5	Knob–Push Switch	17	Binder Screw
6	Knob–Speaker	18	Tapping Screw
7	Knob–Tuning	19	Rubber Cushion
8	Drive Shaft	20	Tapping Screw
9	Bottom Cover	21	Dial Flame
10	Chassis	22	Glass Plate
11	Drum	23	Washer
12	Amp Box assembly		

CHASSIS LAYOUT



DIAL CORD ARRANGEMENT



ALIGNMENT PROCEDURE

INSTRUMENT REQUIRED

1. AM and FM sweep generator
2. AM and FM signal generator
3. Vacuum tube voltmeter (V.T.V.M.) AC.DC
4. Oscilloscope
5. Distortion meter
6. Stereo Modulator

GENERAL ALIGNMENT CONDITIONS

1. Signal input should be kept low as possible.
2. Standard modulation is 400Hz 30% (AM)
   400Hz 100% (FM.MONO), pilot 10% Sub & Main 90% (FM.ST)
3. Standard output is 500mW (2.0V, 8Ω)

STEP	CONNECT SIGNAL SOURCE TO-	SET SIGNAL TO-	CONNECT OUTPUT INDICATOR TO-	SET RADIO DIAL TO-	ADJUST	ADJUST FOR	REMARKS	STEP
1	Set Radio Selector Switch to "AM"							1
2	AM Sweep Generator to-AM Ant.	455KHz	Oscilloscope to-across "AM" OUT" terminal (NAIM-224)	Quiet Point on Band	X104 CFZ-455C	Maximum Symmetrical response	Usually not necessary to adjust	2
3	AM Signal Generator to-AM Ant. through a standard radiating loop	515KHz (modulated)	V. T. V. M. or osilloscope to-across "SPEAKER" terminal	Lower end	L107 NMO-2503 (Red)	Maximum	Repeat steps 3 and 4 as necessary to obtain Maximum sensitivity on stations	3
4		1680KHz (modulated)		Upper end	AM Trimmer (OSC. side)	Maximum		4
5	〃	600KHz (modulated)	〃	600KHz (Tuned to Signal)	L001 NMA-2509 (Coil Antenna)	Maximum	Repeat steps 5 and 6 as necessary	5
6		1400KHz (modulated)		1400KHz (Tuned to Signal)	AM Trimmer (Ant. side)	Maximum		6
7	Set Radio Selector Switch to "FM"			Set Muting Switch to "OFF"				7
8	FM Sweep Generator to-"FM IN" terminal	±0.3MHz Sweep Centered at 10.7MHz	Osilloscope to-across "TP2" terminal (NAIM-224)	Quiet Point on Band	L105 NIT-3503R Top Bottom	Maximum "S" curve Lineality	Not necessary to adjust for Symmetrical response or Zero Voltage	8
9	No Signal		Tuning Indicator may be used as the output indicator	Quiet Point Where FM Signals are not received	L105 NIT-3503R Top	The needle of Tuning Indicator comes to the center		9
10	FM Signal Generator to-across FM Ant. terminal through a matching network	92MHz (100% Mod.)	V. T. V. M to-across "SPEAKER" terminal	92MHz	LO on FM Tuner	Maximum	Repeat steps 10 and 11 as necessary	10
11		104MHz (100% Mod.)		104MHz	TCO on FM Tuner	Maximum		11
12		88MHz (100% Mod.)		Tuned to Signal	LA LR (2 points) on FM Tuner	Maximum	Repeat steps 12 and 13 as necessary	12
13		108MHz (100% Mod.)		〃	TCA TCR (2 points) on FM Tuner	Maximum		13
14	FM Signal Generator to-across FM Ant. terminal through a matching network	98MHz (100% Mod.)	Distortion meter to-across "SPEAKER" terminal	Tuned to Signal	L105 NIT-3503R Bottom	Minimum Distortion	Less than 0. 3%	14
15	Set Radio Selector Switch to "FM"			Set Muting Switch to "ON"				15

STEP	CONNECT SIGNAL SOURCE TO-	SET SIGNAL TO-	CONNECT OUTPUT INDICATOR TO-	SET RADIO DIAL TO-	ADJUST	ADJUST FOR	REMARKS	STEP
16	〃	〃	Osilloscope to- across "SPEAKER" terminal	Tuned and Detuned to Signal	Variable Resistor R713 (100KΩ)	No noise when detuned but less effective for Signal Output when tuned	Signals are not necessarily Squelching by turning R713 counter clockwise	16
17	Set Radio Selector Switch to "FM AUTO"			Set Muting Switch to "OFF"				17
18	〃	98MHz (Pilot Sig. 19KHz 10%) lmV input	V. T. V. M. to- across "TP3" terminal (NAIM-224)	Tuned to Signal	L201 NMC-4-10	Maximum		18
19	〃	98MHz (Pilot Sig. 19KHz 10%) 1KHz R ch 90%	V. T. V. M. to- across "SPEAKER" terminal (R ch)	〃	L202 NMC5-9	Maximum		19
20	〃	98MHz (Pilot Sig. 19KHz 10%) Main & Sub Sig. 1KHz L ch 90%	〃 (R ch)	〃	Variable Resistor R223 (10KΩ)	Minimum	Retouch slightly Repeat Steps 20 and 21 an necessary	20
21	〃	〃 R ch 90%	〃 (L ch)	〃	〃	〃		21

PARTS LIST

CIRCUIT NO.	DESCRIPTION	SPECIFICATION	Q'TY	STOCK NO.	
U1	FM Front End	FL-322U	1	240005	
U2	Power Amp assembly	NAPA-198C	1	13889598C	
U3	Pre-Amp assembly	NAAF-222a	1	13889522A	
U4	IF & MPX assembly	NAIM-224	1	13899524	
U5	Power Supply assembly	NAPS-225	1	13889525	
PL801, PL802	Pilot Lamp	6.3V0.05AW-3	2	210015	
PL803 - PL808	Pilot Lamp	6.3V0.25A	6	210012	
T901	Transformer-Power	NPT-555D	1	230046	
L001	Coil-Antenna	NMA-2508	1	232023	
T001	Transformer-Balloon	NBLN-1	1	233026	
C903, C904	Capacitor-Electrolytic	CE62W35V4700μF	2	3504030A	
C905	Capacitor-Electrolytic	CE62W50V470μFX2	1	3504037A	
C901	Capacitor-Polyester (UL)	UL200V0.01μF(M)	1	3504012	
S801	Switch-Rotary	NRSM-486-30Y-A	1	250106	
S802	Switch-Rotary	NRS-227-30Y-AP	1	250188	
M101	Tuning Indicator	NIND-0500S29	1	243020	Strength meter
M102	Tuning Indicator	NIND-0250S30	1	243021	Tuning meter
	Dial Plate		1	270565	
	Back Plate		1	270211-1	
	Drive Shaft		1	270218	
	Dial Pointer		1	270273	
	Dial Pointer Case		1	270172-2	
	Pointer Holder AS		1	270173	

CIRCUIT NO.	DESCRIPTION	SPECIFICATION	Q'TY	STOCK NO.	
	Amp Box assembly		1	280495	
	Front Panel		1	280718	
	End Cap		2	280319	
	Joiner (L)		2	280352-1	
	Joiner (B)		2	280499	
	Dial Flame		1	280322	
	Glass Plate Holder	(large)	1	280338	
	Glass Plate Holder	(small)	2	280323	
	Glass Plate		1	280259-1	
	Knob Guide		1	280418	
	Knob Guide N		1	280710	
	Bottom Cover		1	280497	
	Rubber Cushion		4	280560	
	Knob-Tuning		1	283051	
	Knob-Speaker, Selector		2	283056	
	Knob-Tone		2	283050	
	Knob-Volume		1	283053	
	Knob-Balance		1	283054-3	
	Knob-Push Switch		7	283069-2	
	Master Carton Box		1	290338	
	Side Pad		2	290284	

NAPA-198c

Q501, Q601	IC	STK 032	2	222003	
D909, D910	Silicon Diode	10D1	2	223801	
D911	Zener Diode	WZ-240	1	223916	
D912	Zener Diode	WZ-120	1	223910	
C501, C601	Capacitor-Electrolytic	CE04W16V4.7μF	2	352740471A	
C509, C609 C918	Capacitor-Electrolytic	CE04W16V47μF	3	352744701A	
C917	Capacitor-Electrolytic	CE04W16V100μF	1	352741011A	
C505, C507 C605, C607	Capacitor-Electrolytic	CE04W35V10μF	4	352761001A	
C510, C610	Capacitor-Electrolytic	CE04W25V47μF	2	352754701A	
C916	Capacitor-Electrolytic	CE04W35V470μF	1	352764711A	
	Fuse	3A-T(SS-2) UL	2	252006	

NAAF-222a

Q301, Q302 Q401, Q402	Transistor	2SC632A-81	4	2210208	
Q303, Q304 Q403, Q404	Transistor	2SC632A-71	4	2210207	
Q902	Transistor	2SD234(Y)	1	2200020	
D913	Zener Diode	WZ-310	1	223909	
C302, C402	Capacitor-Electrolytic	CE04W25V220μF	2	352752211A	
C303, C403	Capacitor-Electrolytic	CE04W50V22μF	2	352782201A	
C304, C404	Capacitor-Electrolytic	CE04W50V0.47μF	2	352784791A	
C324, C424	Capacitor-Electrolytic	CE04W50V3.3μF	2	352780331A	
C325, C425	Capacitor-Electrolytic	CE04W50V1μF	2	352780101A	
C326, C426	Capacitor-Electrolytic	CE04W50V4.7μF	2	352780471A	
C305, C405	Capacitor-Electrolytic	CE04W10V33μF	2	352733301A	
C920	Capacitor-Electrolytic	CE04W35V470μF	1	352764711A	
C922	Capacitor-Electrolytic	CE04W35V220μF	1	352762211A	

CIRCUIT NO.	DESCRIPTION	SPECIFICATION	Q'TY	STOCK NO.	
C301, C401	Capacitor-Aluminum Electrolytic	AL04B10V3.3μF	2	392130337	
C323, C423	Capacitor-Aluminum Electrolytic	AL04B10V2.2μF	2	392130227	
R325, (R425)	Resistor-Variable	N24RJL100KMN 250KBT30.20H	1	5104005	
R342, (R442) R343, (R443)	Resistor-Variable	N24RGP100KB30-1	2	5172021	
	Push Switch	NPS-122LA3	7	250184	

NAPS-225

D901 - D904	Silicon Diode	SR3AM-2B	4	223816	
	Fuse	3A-T(ST-2)UL	1	252005	

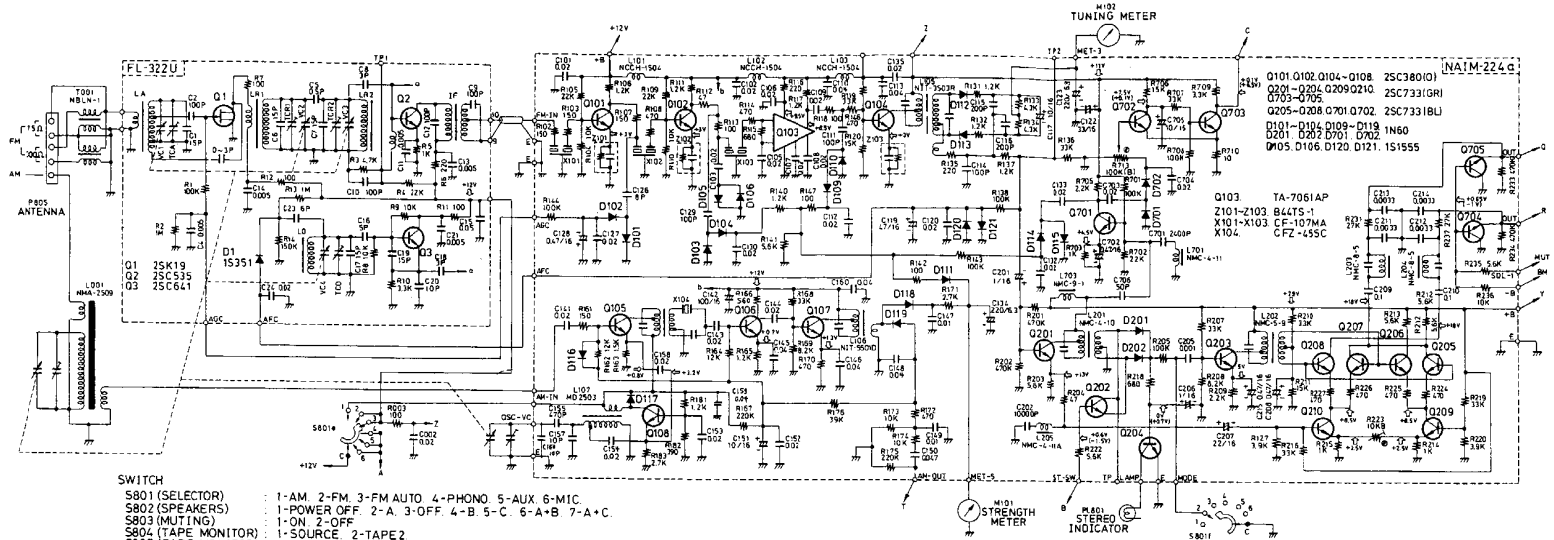
NAIM-224

Q101, Q102 Q104 - Q108 Q201 - Q203	Transistor	2SC380(0)	7	2210123	
Q209, Q210 Q703 - Q705	Transistor	2SC733 (GR)	8	2210085	
Q204	Transistor	2SC734(Y)	1	2210064	
Q205 - Q208 Q701, Q702	Transistor	2SC733(BL)	6	2210086	
Q103	IC	TA-7061AP	1	222402	
D101 - D104 D109 - D119 D201, D202 D701, D702	Germanium Diode	1N60(N)FM	19	2231031	
D105, D106 D120, D121	Silicon Diode	1S1555	4	223105	
L101, L102	Coil-Choke	NCCH-1504	2	233040	
L103	Coil-Choke	NCCH-1501	1	233024	
L105	Transformer-IF	NIT-3503R	1	233022	
L106	Transformer-IF	NIT-5501D	1	232012	
L107	Coil-OSC	NMO-2503	1	232013	
L201	Coil-MPX	NMC-4-10	1	233017	
L202	Coil-MPX	NMC-5-9	1	233019	
L203, L204	Coil-MPX	NMC-8-5	2	233021	
L701	Coil-MPX	NMC-4-11	1	233018	
L703	Coil-MPX	NMC-9-1	1	233031	
L205	Coil-MPX	NMC-4-11A	1	233041	
C117, C151 C705	Capacitor-Electrolytic	CE04W16V10μF	3	352741001A	
C119	Capacitor-Electrolytic	CE04W16V4.7μF	1	352740471A	
C128, C702 C208, C215	Capacitor-Electrolytic	CE04W16V0.47μF	4	352744791A	
C142	Capacitor-Electrolytic	CE04W16V100μF	1	352741011A	
C201	Capacitor-Electrolytic	CE04W16V1μF	2	352740101A	
C123, C134	Capacitor-Electrolytic	CE04W6.3V220μF	2	352722211A	
R223	Resistor-Semi Fixed	R-HK10KB3L	1	5225002	
R713	Resistor-Semi Fixed	R-HK100KB3L	1	5225003	
X101 - X103	Ceramic Filter	SFE-10.7MA	3	3010003	
X104	Ceramic Filter	CFZ-455C	1	3010004	
Z101 - Z103	CR Composit	B44TS-1	3	3020001	

Universal type

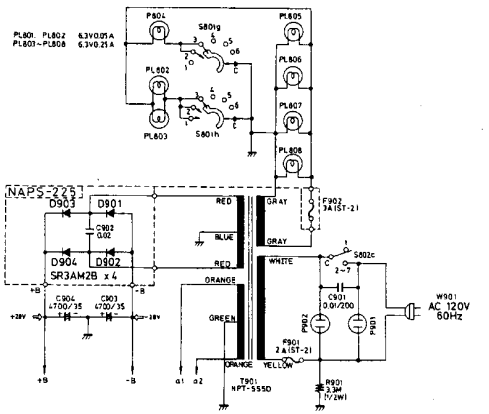
	Transformer - Power	NPT-555ADGQ	1	230058	
	Capacitor-Interference Suppressor		1		
	Voltage Selector		1	250186	

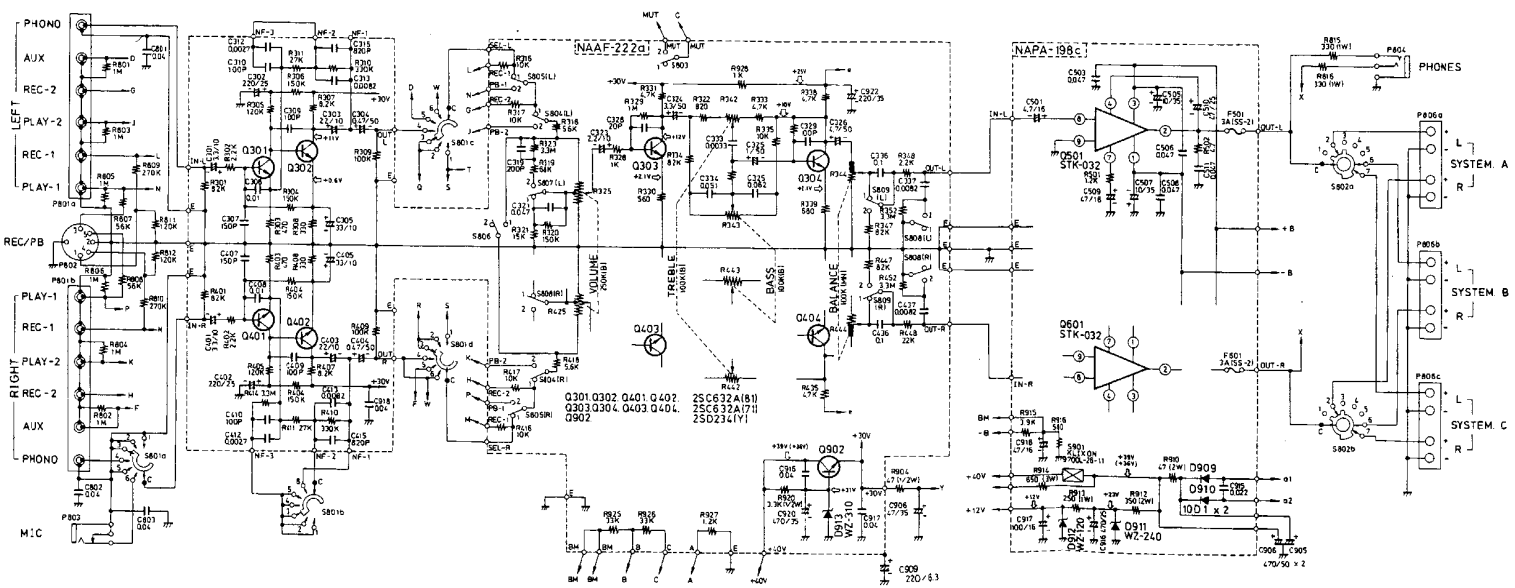
CIRCUIT DIAGRAM



SWITCH

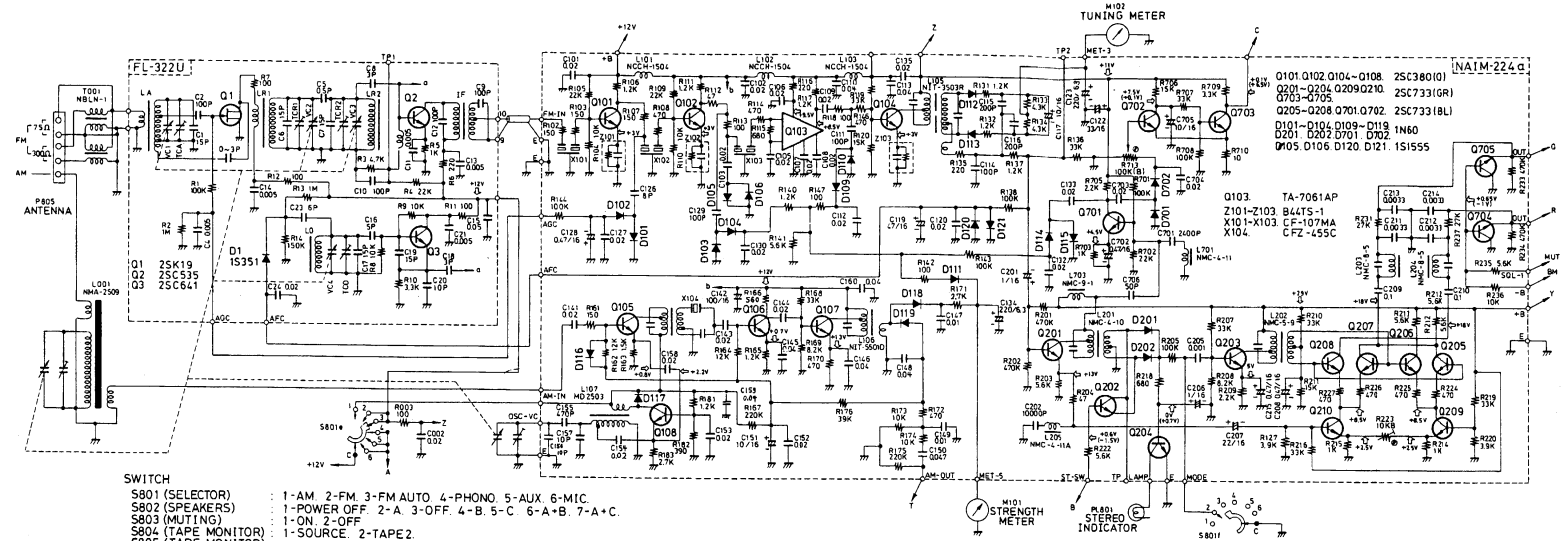
S801 (SELECTOR)	: 1-AM. 2-FM. 3-FM AUTO. 4-PHONO. 5-AUX. 6-MIC.
S802 (SPEAKERS)	: 1-POWER OFF. 2-A. 3-OFF. 4-B. 5-C. 6-A+B. 7-A+C.
S803 (MUTING)	: 1-ON. 2-OFF.
S804 (TAPE MONITOR)	: 1-SOURCE. 2-TAPE2.
S805 (TAPE MONITOR)	: 1-SOURCE. 2-TAPE1.
S806 (MODE)	: 1-MONO. 2-STEREO.
S807 (LOUDNESS)	: 1-OFF. 2-ON.
S808 (HIGH FILTER)	: 1-OFF. 2-ON.
S809 (LOW FILTER)	: 1-OFF. 2-ON.

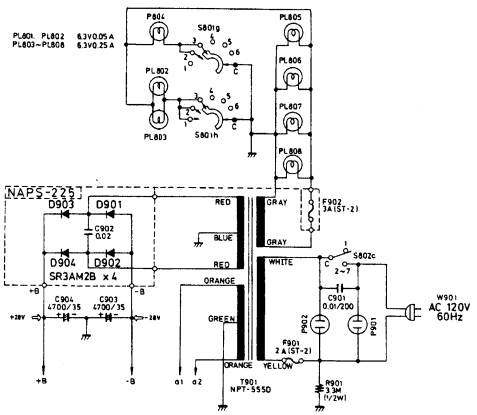


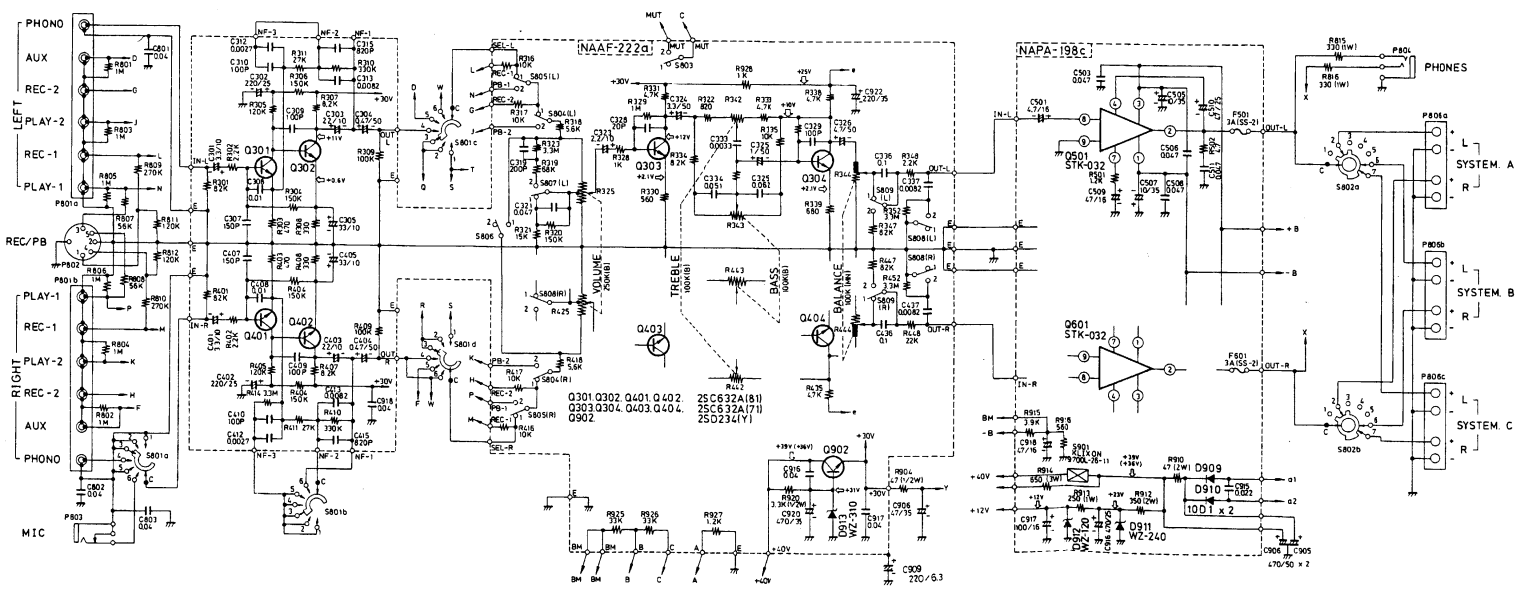


NOTES;
- ALL RESISTORS ARE IN OHMS, ¼WATT UNLESS OTHERWISE NOTED
- ALL CAPACITORS ARE IN μF UNLESS OTHERWISE NOTED
- ELECTROLYTIC CAPACITORS (—⊕⊖—) ARE IN μF/WV.
- VOLTAGE (MEASURED WITH V.T.V.M.)
  ⇨ DC VOLTAGE. (NO INPUT SIGNAL)
  ( ) DC VOLTAGE. (FM-STEREO)

CIRCUIT DIAGRAM







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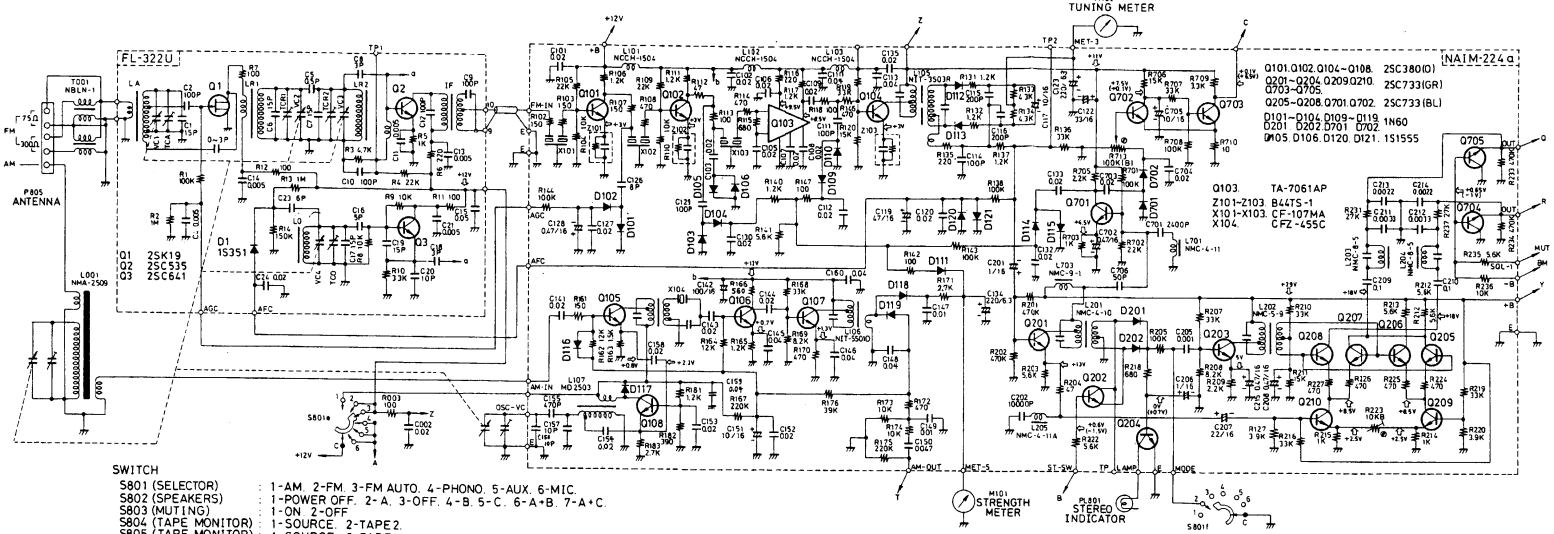
CIRCUIT DIAGRAM

(Universal type)



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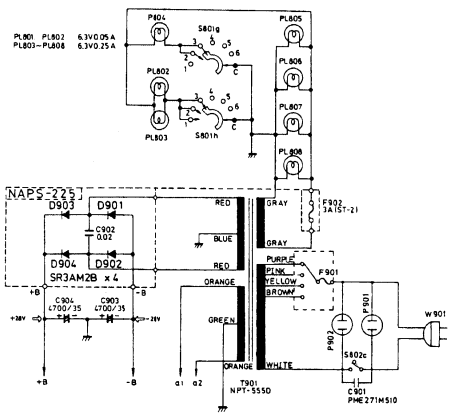

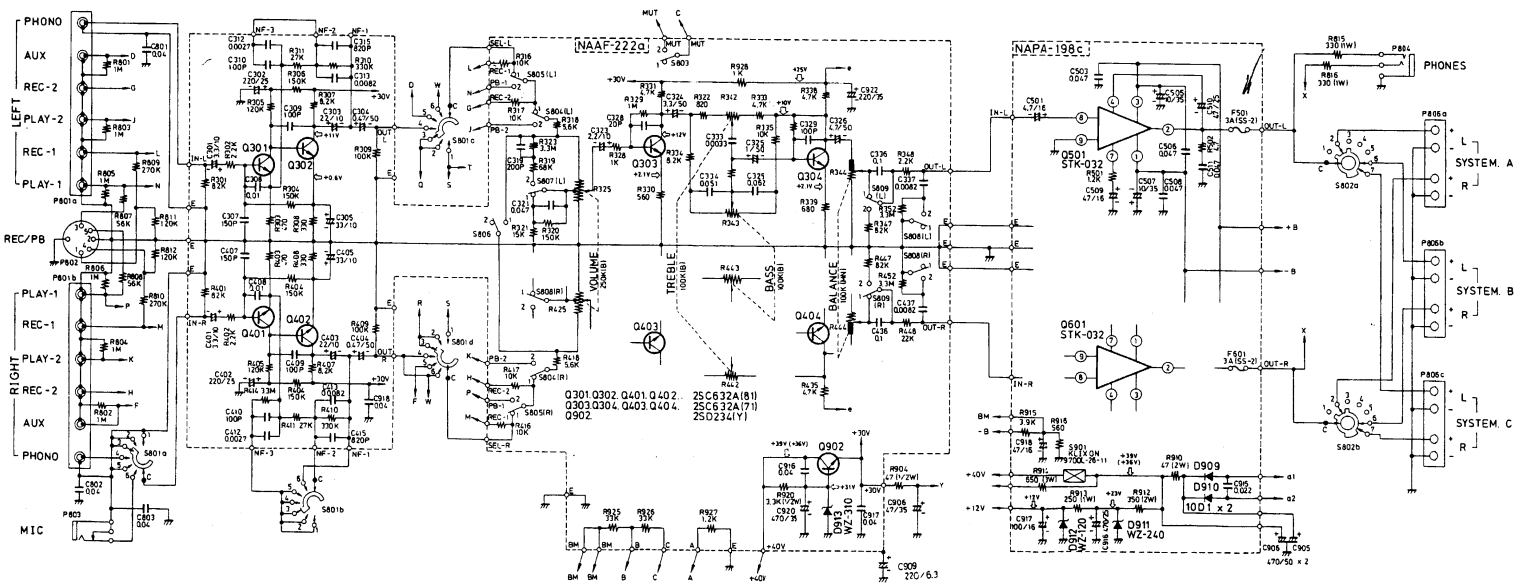

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- ELECTROLYTIC CAPACITORS (⟶|⟵) ARE IN μF/WV.
- VOLTAGE (MEASURED WITH V.T.V.M)
  ⇦ DC VOLTAGE. (NO INPUT SIGNAL)
  ( ) DC VOLTAGE. (FM-STEREO.)

LINE VOLTAGE AND FUSE

The model TX–440 is available in two models: one model operates only on 120V, and the other operates on one of the four line voltages, 110V, 120V, 220V and 240V. If your TX–440 is the latter model, set the unit to proper line voltage by following the procedure described below.

CHANGING LINE VOLTAGE SETTING AND FUSE

To remove the fuse, turn the fuse cap located on the line voltage selector in the direction of the arrow.

Then remove the fuse plug from the unit. Put the fuse plug back so that the proper line voltage marking can be seen through the cut in the edge of the plug.

Whenever the position of the selector is changed, check the rating of the fuse. A 1.5A fuse is to be used for either 220V or 240V operation and a 3A fuse for 110V or 120V operation.

FUSE REPLACEMENT

When the fuse blows, remove the fuse cap and replace the fuse with a new one. See Fig. 1.

If you replace the fuse, use the fuse of the specified capacity.

AC fuse	2A timelag type
Pilot lamp fuse	3A timelag type

Speaker protective fuse–3A standard type.

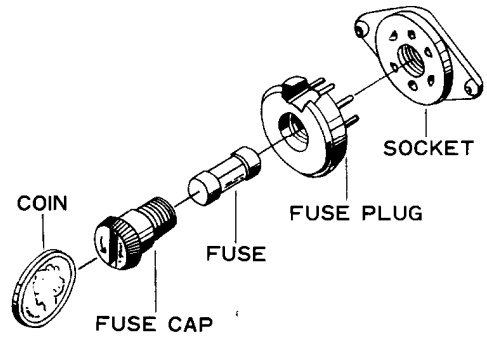

Fig. 1

PACKING PROCEDURE

1. Tighten SPEAKER terminals by a hand.
2. Clean an AMP BOX assembly, attending to your fingerprints.
3. Set a SENSITIVITY SWITCH to center (2.4mV).
4. Clean a REAR PANEL and a RADIATOR.
5. Insert SHORTED PIN into PHONO–1, 2 terminals.
6. Wrap a POWER CORD with a AC CORD WRAPPER and bind it with a rubber band.
7. Wrap unit with a AMP COVER and attach a SIDE PAD to both sides.
8. Put in a CARTON BOX and make sure the front marks of the carton matches the unit front.
9. Put an ACCESSORY BAG including an INSTRUCTION BOOKLET, WARRANTY CARD etc in the box.
10. Close the CARTON BOX and seal.